horseman. The head is the first point, however; let us have that protected and the efficiency of the cavalry will be doubled. Who will introduce a cavalry helmet?

GREATER ECONOMY IN COAL CONSUMPTION DEMANDED.

The exorbitant demands of the coal-dealers are causing a universal inquiry into the justice or necessity of such prices as are exacted. We have seen no evidence adduced that is worthy of a moment's attention, which could justify the enormous advance of this article of prime necessity, although it has been urged that the strikes of the miners and inadequate facilities for transportation are insuperable obstacles to a reduction of the price. If the public cannot succeed in inducing the coalition—for there evidently is one somewhere in the coal interest—to abate one jot of their exactions, they may at least coöperate with us in calling forth, and employing when brought to light, improvements in furnaces of all descriptions, whether for steam purposes, culinary use, or warming apartments. It is a notorious fact that a large part of the fuel, whether wood or coal, daily used, is not economized as it should be, either in burning it or in using it after it has passed through the fire. Although American stoves and furnaces rank deservedly high for apparatuses of their class, yet we think the most sanguine inventor who has ever investigated the subject will admit that there is room for improvement, and that too many of the stoves and ranges now in use devour fuel as greedily as if their proprietors held the fee simple of a coal mine. The actual value of a stove, furnace, or steam boiler depends upon the arrangement and amount of surface exposed to the action of heat, and so contrived that the greatest possible amount of caloric will be extracted from the ignited gases before they pass up the chimney. The heat, at a reasonable distance from the stove, which passes off into the air through the pipe unused, is a proof that more fuel is burned than the stove can work to advantage, and also that money is expended for which there is no return. The same is the case with steam boilers; although we do not anticipate that the currents passing through the chimney—that gases liberated by combustion will be so cooled that the smoke-pipe will answer the purpose of a refrigerator—yet we do expect that vital improvements will be made so that the heat which issues from the smoke-pipe will not be so great as to burn out the top of the same in a short time, sixty feet or more from the furnace.

We remarked at the commencement of this article, that fuel, more particularly coal, was not generally used after it had once passed through the fire. Such is the fact. All of the coals are not subjected to the same heat alike, and some are reduced to cinders and ashes while others are only roasted or calcined and turned into coke. This refuse, so-called, properly screened and picked out, makes an excellent summer fuel, easily ignited, and gives heat enough for ordinary purposes, and it is inconceivable why so many persons throw away their ashes, and with it certainly a tenth of their coal account. Such waste is reprehensible and ought to be checked, and we hope ere long to chronicle a great addition to the list of improved coal burning apparatuses.

THE ENGLISH STEAM FIRE-ENGINE TRIAL.

In a conversation we had recently with a celebrated builder of steam fire-engines in this city, he expressed the opinion that, in the forthcoming trial to be had in London, our engines would prove victorious in point of distance to which water could be thrown. The English are very partial to the quantity of water projected in a given time, as a favorable quality of a steam engine, and all their machines have a much less proportion of steam area in the pistons than have ours when the relative size of the pumps is taken into account. The *Manhattan* steamer, of this city, is considered a favorable exponent of the American steam fire-engine, but it is said that the English engineering community do not look upon the rotary pump with much favor. We think this rather anomalous, considering the merits accorded to the Gwynne centrifugal pump, and the changes rung upon it by all English journals, from those competent to criticize its qualities down to others who do not know the difference between a rotary pump and a penny whistle. We have expected to see some English fire-engine fitted with this pump, and a trial had of its virtues or advantages over the Carey pump, such as is the *Manhattan's;* there may be some engine of this kind entered for exhibition, but we have been given to understand that the English machines are all fitted with reciprocating pumps. A large proportion of our mechanics are away at the war, fighting for their country, but those who remain will look eagerly for the result of the trial, as they expect to see the confidence they have placed in their machines fully sustained.

THE DISCOVERERS OF THE SOURCE OF THE NILE.

Captains Speke and Grant, whose discovery of the true source of the Nile was formerly noticed in our columns, have arrived in London, and were publicly received by the Royal Geographical Society on the evening of the 23d ult. Sir Roderick Murchison introduced the two travelers, who addressed the meeting and gave an interesting account of their discoveries and adventures. They were attended by two boys, aged about 15 years, natives of the country, who were brought to England with the consent of their parents to receive a good education and then be sent back to their native clime. Their skin is black and their heads covered with the usual coat of wool, but their features are regular, their noses being straight and foreheads as high as those of Europeans. The races in the region of Lake Nyanza (Captain Speke believes) are descended from the Abyssinians and Hindoos. The men are tall and well made, and they are honest and friendly.

When Captain Speke visited the king of Uganda, his sable majesty said he must sit on the ground and wait until he was given an audience. The captain answered that he was a prince and was not accustomed to wait; and he terrified the king and his whole court into submission by opening his umbrella, which they took to be a deadly weapon employed for killing by magic.

Lake Nyanza, the source of the Nile, is situated at an elevation of 3 500 feet above the level of the sea, in latitude three degrees south, and from where the Nile leaves this lake until it reaches the Mediterranean Sea it traverses a distance of 3,000 geographical miles. The lake is in the region of the Mountains of the Moon, in the middle of the rainy zone where, in 1862, Captain Speke noticed that rain fell, more or less, during 233 days of the year. This accounts for the perpetual supply of waters to the Nile. At the center of the northern coast of the lake the parent stream of the Nile issues over a precipice twelve feet in hight. The travelers proceeded down this branch from Lake Nyanza, and after many delays and incidents reached Rhartown last spring; the time of their travel having occupied two years and a half, and the distance explored being 3.000 miles.

OUR "BRANCH OFFICE" AND THE WAR.

At the beginning of the invasion of Pennsylvania the necessity of "uncovering" Washington became a fixed fact; but to leave it unprotected, while the army of Gen. Meade went forth to drive back the forces of Gen. Lee, might result in its possible capture by Gen. Beauregard's forces, which were understood to be "on the move" from Richmond to aid the rebel army of invasion. To provide against this exigency the President called into the service for sixty days—unless sooner discharged—every able-bodied man between 18 and 45, within the limits of the District of Columbia. The entire force employed in the Washington "Branch Office" of the SCIENTIFIC AMERICAN was called out, and, we are happy to know, went cheerfully to meet the summons. At one time it seemed to us that we should be compelled—for a short time, at least—to close our efficient "Branch Office." We are much pleased to learn, however, that the President considers that the exigency no longer exists, and all our Washington *employés* are now following their accustomed duties in our service.

THE ram *Atlanta* has been pronounced unseaworthy by an examining board from our navy at Port Royal. She has six inches of water in her hold, and a steady leak is observable in the place where the iron-work is fastened to the hull. Her guns are all marked "Tredegar Iron-works, Richmond," and one of them is of this year's casting.

KRUPP'S PRUSSIAN STEEL-WORKS.

At the recent great International Exhibition in London, the products of the immense steel-works of Frederick Krupp, at Essen, Prussia, attracted great attention from scientific and practical men of all countries, by reason of the character and class of articles made at that establishment. Steel crank-shafts forged solid, double throw, are produced weighing 12 tuns and over; cast-steel guns of the largest bores and the finest possible texture are turned out according to contract in large numbers. The Russian Government are now having 100 steel breech-loading guns made, of 11¾ inches bore, and weighing approximately 16,666 pounds, at an aggregate cost of 500.000 thalers. (A thaler is 70 cents.) Our own Government has also ordered a 7½ inch steel gun, Dahlgren pattern, to experiment with. Every kind of steel forging that can be named is made by Krupp; and his steel tires for locomotives are especially commended by all who have used them. The tires for locomotives are made without a weld, and are calculated to run from 80,000 to 100 000 miles without turning; and when turned up they lose but ¼ of an inch of metal. The "life" of a 2-inch tire is usually computed at about 250.000 miles on an average. Cast-steel ingots are produced weighing 40 tuns, which are forged under a steam hammer of 50 tuns' weight, having a fall of 10 feet. The cannon have undergone trials at Woolwich (England) which have proved that they cannot be bursted, so exceedingly tough and well wrought is the nature of the metal. Nearly all the Governments in the world have ordered some cannons from Krupp's works. A bolt, 8 feet 9.5 inches long and weighing 1.000 pounds, was fired from one of Krupp's patent breech-loaders, without injury to the gun or breech-loading apparatus.

The works are located near the Rhine, about 50 miles below Cologne, on the opposite bank of the river; they cover nearly 200 acres, about one-tenth of which are under roofs. The consumption of coal is about 250 tuns per day; the coal is obtained in the immediate neighborhood.

Mr. Krupp's New York agent - Mr. Thomas Prosser, of 28 Platt street, this city—has large lithographs representing Krupp's works and other matters connected with that establishment, all of which are very interesting.

TESTING ORDNANCE.—For several weeks past, a thirteen-inch gun, of Rodman's model, cast at Fortress Monroe, has undergone a series of experiments. Its weight is 33 615 pounds, and it is fourteen feet long. A two-hundred-and-seventy-five-pound shot has been fired, with a charge of thirty pounds of powder, and, as yet, there is no perceptible enlargement of the bore, though the piece has been discharged nearly three hundred times. Thus far the experiments have been confined to trying the gun's durability; but, in a few days, the test will be made as to the distance and penetrability of the projectiles thrown.—*Pittsburgh Dispatch.*

THE ship *Resolution*, in which Captain Cook left England on his second voyage round the world in 1772—ninety years since—is now at Demerara waiting a cargo of sugar.

THE amount of money found in letters at the Dead Letter Office, during the last year, was over $80,000, being an excess of $30,000 over the previous twelve months.

DIVERS have already succeeded in securing $40,000 worth of goods, and raised one box containing $32,000 in specie, from the wreck of the *Anglo-Saxon*, off the coast of Nova Scotia.

IT is estimated that the aggregate yield of the California gold mines, since the discovery of gold in 1846, is twelve hundred and fifty millions of dollars.

ASSISTANT-SECRETARY OF THE NAVY, FOX, states that the whole number of vessels captured or destroyed by the blockading fleet up to June 1, is 855.

UPWARDS of £300.000 have been subscribed in England to the Atlantic telegraph, and it is said that the work is to be prosecuted immediately.

IT is said that a bank-note printed in blue on a yellow ground is the only one which cannot be reproduced by photography.